

EPTATRETUS MENEZESI, A NEW SPECIES OF HAGFISH
(AGNATHA, MYXINIDAE) FROM BRAZIL

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ABSTRACT

The previous records of the genus *Eptatretus* from the western Atlantic are restricted to Central America and adjacent waters. The first record of the genus *Eptatretus* in the southwest Atlantic is presented, based on a new seven-gilled species caught in the Brazilian coast and described as *E. menezesi*. This new species is compared with *E. caribbeaus*, the only seven-gilled species of the Atlantic that has a 3-cusp multicusp on both anterior and posterior sets of cusps.

A preliminary review of western Atlantic hagfishes of the genus *Eptatretus* was presented by Fernholm and Hubbs (1981) and Fernholm (1982), who cited the following species: *E. springeri* (Bigelow and Schroeder, 1952); *E. minor* Fernholm and Hubbs, 1981; *E. multidentis* Fernholm and Hubbs, 1981; *E. caribbeaus* Fernholm, 1982; and other three forms provisionally designated as *Eptatretus* sp. A, B and C. Subsequently, Shimizu (1983) presented a brief description of *Eptatretus* sp., an apparently unnamed species collected off Surinam. Finally, Hensley (1985) described *E. mendozai* from off the southwest coast of Puerto Rico. All the western Atlantic species cited above have been recorded only in Central America and adjacent waters.

During several trapping surveys and longline fishing operations off southeastern and southern Brazil, a new *Eptatretus* species was collected. The aim of this paper is to describe this new species.

MATERIALS AND METHODS

The studied material is deposited in the following repositories: MCP – Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul (Rio Grande do Sul, Brazil); MOVI – Museu Oceanográfico do Vale do Itajaí (Santa Catarina, Brazil) and MZUSP – Museu de Zoologia da Universidade de São Paulo (São Paulo, Brazil).

The specimens were caught between 250 and 530 m depths, on the continental slope (Fig. 1). Measurements and counts are those reported by Fernholm and Hubbs (1981) and McMillan and Wisner (1984). The names of some structures were updated according to Wisner and McMillan (1995). The key to western Atlantic species of *Eptatretus* was modified from Hensley (1985) to include the new species.

KEY TO THE WESTERN ATLANTIC SPECIES OF *EPTATRETUS*

[Modified from Hensley (1985)]

- 1a. A 3-cusp multicusp on anterior set, a 2-cusp multicusp on posterior set of cusps 2
- 1b. A 3-cusp multicusp on both the anterior and posterior sets of cusps 5
- 2a. Gill apertures 6 or 7 3
- 2b. Gill apertures 5 4
- 3a. Total slime pores 84–92. Maximum known length 590 mm. Northeastern Gulf of Mexico
..... *E. springeri*

- 3b. Total slime pores 78. One specimen, 433 mm. North of the Bahamas *Eptatretus* sp. A (Fernholm and Hubbs, 1981)
- 4a. Each anterior set with total of 13 cusps, each posterior set with total of 12–13 cusps. One specimen, 308 mm. South of the Bahamas *Eptatretus* sp. B (Fernholm and Hubbs, 1981)
- 4b. Each anterior set with total of 9 cusps, each posterior set with total of 8 cusps. One specimen, 588 mm. Off Surinam *Eptatretus* sp. (Shimizu, 1983)
- 5a. Gill apertures 6 (rarely 5) 6
- 5b. Gill apertures 7 9
- 6a. A thin whitish middorsal stripe. Total cusps count 46–54. Maximum known length 395 mm. Northeastern Gulf of Mexico *E. minor*
- 6b. No whitish middorsal stripe. Total cusps count 52–61. Caribbean Sea and Atlantic Ocean off French Guiana and Haiti 7
- 7a. Total slime pores 87–91. Total cusps count 52–57. Maximum known length 655 mm. Caribbean Sea and Atlantic Ocean off French Guiana *E. multidentis*
- 7b. Total slime pores 75–82. Total cusps count 56–61 8
- 8a. Trunk slime pores 45–48. Caribbean Sea off Puerto Rico *E. mendozai*
- 8b. Trunk slime pores 44. One specimen, 380 mm. North of Haiti *Eptatretus* sp. C (Fernholm and Hubbs, 1981)
- 9a. Total slime pores 79–85. Tail slime pores 11–13. Caribbean Sea *E. caribbeaus*
- 9b. Total slime pores 86–94. Tail slime pore 14–18. Brazil *E. menezesi*

***Eptatretus menezesi* new species**

(Table 1, Fig. 2)

Holotype.—MOVI 14729, female, 737 mm TL, 29°14'S, 48°02'W, 250 m, longline, 31 July 1998, MARGUS II.

Paratypes.—MOVI 14730, 1 spec. (616 mm), taken with holotype; MOVI 06084, 1 (496 mm) and MZUSP 51422, 1 (517 mm), 28°26'04"S, 46°56'50"W, 530 m, baited trap, 11 December 1996, RV DIADORIM; MCP 21156, 1 (495 mm), MOVI 06081, 1 (490 mm), MZUSP 51418, 1 (532 mm) and MZUSP 51419, 1 (492 mm), 28°34'49"S, 47°01'32"W, 490 m, baited trap, 10 December 1996, RV DIADORIM; MOVI 13347, 1 (613 mm), 29°37'42"S, 48°00'30"W, 380 m, baited trap, 27 April 1997, RV DIADORIM; MOVI 13349, 1 (520 mm) and MZUSP 52492, 2 (390–462 mm), 24°09'19"S, 43°14'13"W, 510 m, baited trap, 6 December 1997, RV PROF. W. BESNARD.

Additional Material.—MOVI 13344–6, 3 spec. (286–363 mm) and MZUSP 52494, 9 (277–545 mm), 29°18'52"S, 47°52'30"W, 490 m, baited trap, 23 April 1997, RV DIADORIM; MOVI 13348, 1 (376 mm) and MZUSP 52493, 12 (314–602 mm), 29°37'42"S, 48°00'30"W, 380 m, baited trap, 27 April 1997, RV DIADORIM.

Diagnosis.—A seven-gilled species of *Eptatretus*; a 3-cusp multicusp on both the anterior and posterior sets of cusps; total slime pores 86–94; tail slime pores 14–18; ventral finfold vestigial; light brown over the body and dark brown over the caudal finfold.

Description.—Proportions and counts are given in Table 1. Body robust, deeper than wide, laterally compressed toward tail; tail rounded; ventral finfold vestigial, 1–2 mm high, originating about one-half of distance between posteriormost gill apertures and anterior edge of cloaca, extending to cloaca; slime pores segmentally arranged on each side of the body, extending from behind the head to beyond the cloaca; rostrum rounded; length of first and second pair of barbels respectively, about 64% and 69% of length of third pair; dental muscle overlies gill pouches 2–5, ventral aorta branches at gill pouches

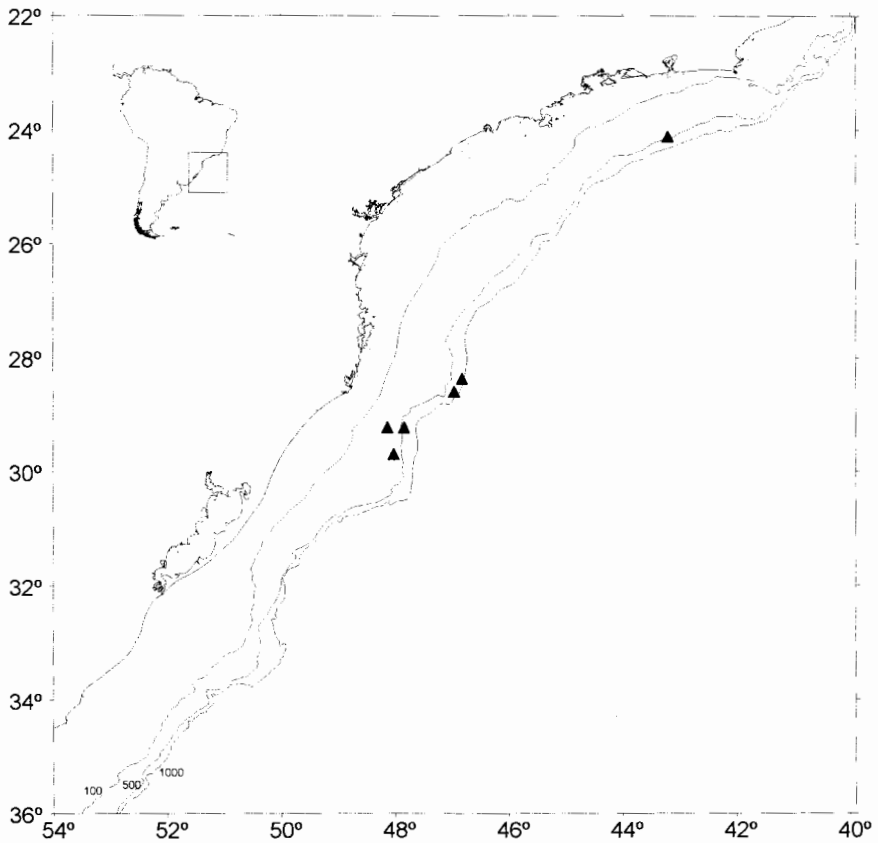


Figure 1. Records of *Eptatretus menezesi* in the southwest Atlantic.

5–6; dental muscle length 21.3–28.3% of TL, its width 13.4–18.8% of its length, and its depth 43.8–72.0% of its width; distance between tip of the dental muscle and branching of ventral aorta 10.6–18.8% of dental muscle length; seven gill apertures on each side, corresponding to seven pairs of internal gill pouches, the posteriormost on the left side having a common opening with the pharyngocutaneous duct.

Color light brown over the body and dark brown over the caudal finfold; mouth margin variably whitish; tip of the barbels whitish; conspicuous eyespots; gill apertures variably with narrow whitish margin; opening of the pharyngocutaneous duct and slime pores of same color as body; ventral finfold with whitish margin; caudal finfold without whitish margin.



Figure 2. *Eptatretus menezesi*, holotype, female, 737 mm TL.

Table 1. Body proportions (in thousandths of TL) and counts for western Atlantic seven-gilled species of *Eptatretus* with a 3-cusp multicusps on both the anterior and posterior sets of cusps.

	<i>E. menezesi</i>			<i>E. caribbeus</i>		
	37 specimens incl. holotype		holotype MOVI 14729	5 specimens incl. holotype	holotype	
	mean (SD)	range		(from Fernholm, 1982)	MCZ	
				mean (SD)	range	40409
Total length TL (mm)	450 (118.6)	277–737	737	358 (20.6)	331–385	331
Weight (g)	269 (210)	57–931	931	113 (40.2)	79–177	84
<i>Measurements:</i>						
Preocular length	49 (5.8)	38–66	45	59	56–61	–
Prebranchial length	218 (15.0)	191–273	227	223 (8.1)	214–236	214
Branchial length	66 (6.1)	50–83	50	69 (8.0)	58–78	73
Trunk length	550 (22.5)	512–648	528	532 (22.2)	504–560	517
Tail length	172 (13.8)	146–220	195	180 (11.1)	165–196	196
Body width	52 (4.9)	39–61	53	56 (12.0)	48–77	48
<i>Body depth:</i>						
Inc. ventral finfold	90 (9.2)	74–110	100	97 (19.0)	77–114	97
Exc. ventral finfold	88 (8.8)	71–106	99	93 (13.9)	74–106	–
Over cloaca	77 (5.3)	66–91	66	77 (10.2)	69–92	69
Tail depth	87 (7.0)	66–106	81	96 (13.8)	75–109	97
<i>Barbel length:</i>						
First	12 (1.4)	9–15	9	13 (2.1)	11–16	14
Second	13 (1.7)	10–17	11	15 (2.5)	17–24	19
Third	18 (2.4)	11–22	15	20 (2.9)	17–24	21
<i>Counts:</i>						
<i>Cusps:</i>						
Multicusps	3/3		3/3	3/3		3/3
Anterior unicusps*		10–12	11+12		11–13	11+12
Posterior unicusps*		9–12	11+11		10–11	10+11
Total cusps	56 (2.3)	52–60	57	56 (1.6)	54–58	56
<i>Slime pores, left side:</i>						
Prebranchial	15 (1.0)	13–17	15	14 (0.9)	13–15	13
Branchial	7 (0.5)	6–8	7	6 (0.0)	6–6	6
Trunk	52 (1.2)	48–55	50	50 (1.9)	47–52	50
Cloacal	3 (0.5)	2–4	3	–	–	–
Tail	16 (1.1)	14–18	18	12.4 (0.9)	11–13	12
Total pores	90 (2.0)	86–94	90	82 (2.3)	79–85	81
Gill apertures, both sides*	14 (0.0)	14–14	7+7	14 (0.0)	14–14	7+7

* Left + right count for single specimen.

Of 37 specimens examined, 27 are female and 10 male. Females larger than 550 mm TL presented large eggs, but in no examined mature females were the eggs presented encapsulated anchor filaments. The holotype (737 mm TL) contained 44 eggs, the largest measuring 41×11 mm.

Distribution.—Southeastern and southern Brazil, at depths from 250 to 530 m (Fig. 1).

Etymology.—I dedicate this species to Naércio A. Menezes, Museu de Zoologia da Universidade de São Paulo (MZUSP), in recognition of his extensive contribution to Brazilian ichthyology.

Comparisons.—Only another Atlantic species of *Eptatretus* with seven gill apertures and a 3-cusp multicusp on both the anterior and posterior sets of cusps is known, *E. caribbeaus* Fernholm, 1982, recorded in the Caribbean Sea.

E. menezesi differs from *E. caribbeaus* by number of total slime pores (86–94 vs 79–85), tail pores (14–18 vs 11–13) and color (light brown over the body and dark brown over the caudal finfold vs light to very light tan).

A single Atlantic specimen from north of Grand Bahama Island described as *Eptatretus* sp. A in Fernholm and Hubbs (1981), has also seven gills apertures, but its pattern of cusps on multicusp is 3/2, unlike *E. menezesi*.

In the Pacific Ocean four other seven-gilled *Eptatretus* species are known: *E. cirrhatus* (Bloch and Schneider, 1801), *E. carlhubbsi*, *E. laurahubbsi* and *E. strahani* described by McMillan and Wisner (1984), however they are not closely related to new species herein described.

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